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DATE: Saturday, November 15, 2003 Printable Copy Create Case

Set Name side by side	**Query**	**Hit Count**	**Set Name** result set
	DB=USPT; PLUR=YES; OP=ADJ		
L5	l4 same (polic$3 or filter$3 or flood$3)	2	L5
L4	(router or network device or bgp or border gateway protocol) near5 receiv$3 same routing same (interdomain or intradomain or domain)	33	L4
L3	(router or network device or bgp or border gateway protocol) near5 receiv$3 samerouting same (interdomain or intradomain or domain)	0	L3
L2	receiv$3 same routing same(bgp or border gateway protocol) same (filter$3 or polic$3)	19	L2
L1	receiv$3 same (external or outside) near3 (domain or subnet)same rout$3 near5 (information or table or data)	13	L1

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Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT; PLUR=YES; OP=ADJ		
L8	plurality near5 (device or router or bgp) same receiv$3 near5 routing same domain	2	L8
L7	plurality near5 (device or router or bgp) same receiv$3 near5 routing same (first or single) domain	0	L7
L6	plurality near5 (device or router or bgp) same receiv$3 near5 routing	140	L6
L5	l4 same (polic$3 or filter$3 or flood$3)	2	L5
L4	(router or network device or bgp or border gateway protocol) near5 receiv$3 same routing same (interdomain or intradomain or domain)	33	L4
L3	(router or network device or bgp or border gateway protocol) near5 receiv$3 samerouting same (interdomain or intradomain or domain)	0	L3
L2	receiv$3 same routing same(bgp or border gateway protocol) same (filter$3 or polic$3)	19	L2
L1	receiv$3 same (external or outside) near3 (domain or subnet)same rout$3 near5 (information or table or data)	13	L1

Term	Documents
ADVERTIS$6	0
ADVERTIS	2
ADVERTISATION	1
ADVERTISE	2080
ADVERTISED	3029
ADVERTISEDRATE	1
ADVERTISED-IT	1
ADVERTISED-ON	1
"ADVERTISED.SUB"	1
ADVERTISEING	1
ADVERTISEMANT	2
(L16 AND (ADVERTIS$6 OR FLOOD$5 OR DESSIMINAT$5) NEAR5 POLIC$3).USPT.	3

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Term	Documents
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ADVERTIS	2
ADVERTISATION	1
ADVERTISE	2080
ADVERTISED	3029
ADVERTISEDRATE	1
ADVERTISED-IT	1
ADVERTISED-ON	1
"ADVERTISED.SUB"	1
ADVERTISEING	1
ADVERTISEMANT	2
(L16 AND (ADVERTIS$6 OR FLOOD$5 OR DESSIMINAT$5) NEAR5 POLIC$3).USPT.	3

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Set Name side by side	**Query**	**Hit Count**	**Set Name** result set
	DB=USPT; PLUR=YES; OP=ADJ		
L17	L16 and (advertis$6 or flood$5 or dessiminat$5) near5 polic$3	3	L17
L16	l14 and (routing or router or device) with polic$3	67	L16
L15	14 and (routing or router or device) with polic$3	1940	L15
L14	(bgb or ospf or border or shortest path or link state) near5 (routing or router) same (message or information or data)	393	L14
L13	receiv$3 near5 rout$3 same (filter$3 or polic$3) same flood$3 same (device or domain)	1	L13
L12	receiv$3 near5 rout$3 same (filter$3 or ploc$3) same flood$3 same $domain	0	L12
L11	l1 and polic$3	0	L11
L10	l1 same polic$3	0	L10
L9	flood$3 same $domain same rout$4	41	L9
L8	$domain	77655	L8
L7	bgb same $domain	0	L7
L6	rout$4 same policy same filter$3 same (flood$3 or distribut$6 or broadcast43)	6	L6
L5	rout$4 near5 (table or information) same policy same filter$3 same (flood$3 or distribut$6 or broadcast43)	0	L5
L4	rout$4 near5 (table or information) same policy samefilter$3 same (flood$3 or distribut$6 or broadcast43)	0	L4
L3	receiv$3 same rout$4 near5 (table or information) same policy samefilter$3 same (flood$3 or distribut$6 or broadcast43)	0	L3
L2	receiv$3 same rout$4 near5 (table or information) same policy samefilter$3 same (flood$3 or distribut$6 or broadcast43) same $domain	0	L2
L1	receiv$3 near5 rout$4 near5 (table or information) same policy near5 filter$3 same (flood$3 or distribut$6 or broadcast43) same $domain	0	L1

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DATE: Saturday, November 15, 2003 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT; PLUR=YES; OP=ADJ		
L12	L11 same (distribut$3 or flood$3 or broadcast$3)	8	L12
L11	receiv$3 same rout$4 near5 information same(polic$3 or filter43)	63	L11
L10	(bgp or border gateway protocol) same (inter adj domain or intra adj domain or interdomain or intradomain) same rout$3	43	L10
L9	(bgp or border gateway protocol) same (interdomain or intradomain or domain) same rout$3	63	L9
L8	L7 same (filter$3 or polic$3)	22	L8
L7	(bgp or border gateway protocol) same (inter adj domain or intra adj domain or interdomain or intradomain) same (flood$3 or ospf or link state)	29	L7
L6	(bgp or border gateway protocol) same (inter adj domain or intra adj domain or domain) same (flood$3 or ospf or link state)	21	L6
L5	(bgp or border gateway protocol) same (interdomain or intradomain or domain) same (flood$3 or ospf or link state)	45	L5
L4	(bgp or border gateway protocol) same (interdomain or intradomain or domain) same (flood$3 or ospf or link state) same (polic$3 or filter$4)	28	L4
L3	(bgp or border gateway protcol) same (interdomain or intradomain) same (flood$3 or ospf or link state) same (polic$3 or filter$4)	0	L3
L2	(bgp or border gateway protcol) same (interdomain or interadomain) same (flood$3 or ospf or link state) same rout$3	2	L2
L1	(bgp or border gateway protcol) same (interdomain or interadomain) same (flood$3 or ospf or link state) samerout$3	0	L1

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L1: Entry 1 of 13 File: USPT Aug 5, 2003

DOCUMENT-IDENTIFIER: US 6603756 B1
TITLE: Hierarchical label switching across multiple OSPF areas

Detailed Description Text (2):
To understand how the present invention reduces routers' required topological-informational storage, consider the data-packet-forwarding scenario that FIG. 6 illustrates. FIG. 6 depicts transmission of a packet from a source router S to a destination node D. The forwarding path passes through a routing domain 44 to which neither S nor D belongs. That is; routers within routing domain 44 maintain a consistent view of that domain's internal topology by exchanging OSPF messages with each other, but they send no OSPF messages outside the domain. This may be because the domain 44 is the property of, say, an ISP, whereas nodes S and D are owned by that ISP's customers. (As those skilled in the art will recognize, routers within domain 44 will typically use, say, the Border Gateway Protocol ("BGP") to send router S some type of routing information. But the information it thereby receives about the domain's internal topology depends on that domain's policy and is normally extremely limited.)

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L1: Entry 5 of 13 File: USPT Oct 29, 2002

US-PAT-NO: 6473421
DOCUMENT-IDENTIFIER: US 6473421 B1

TITLE: Hierarchical label switching across multiple OSPF areas

DATE-ISSUED: October 29, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tappan; Daniel C.	Boxborough	MA		

US-CL-CURRENT: 370/351; 370/399

ABSTRACT:

In a communications-networking autonomous system consisting of an OSPF domain, autonomous-system border routers (I-ASBR and E-ASBR) cause exchange of hierarchical forwarding labels whose hierarchies are based on OSPF areas. A border router transmits into the domain an OSPF LSA Update message containing an AS-External LSA whose External Route Tag field other routers interpret as specifying a label to be used for forwarding. When that LSA is flooded into the OSPF domain, area border routers respond by flooding new LSAs created from the received one by replacing the label contained in the External Route Tag field with labels that specify their forwarding tables' locations containing information for forwarding to the originating autonomous system border router. In so doing, they enable packets destined for an extra-domain location to be forwarded through the autonomous system without requiring non-border routers to allocate labels to the exterior location or to border routers outside their areas. This enables a networking backbone to conserve its label space even though it carries a large variety of external traffic.

32 Claims, 9 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

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L4: Entry 10 of 33 File: USPT May 20, 2003

DOCUMENT-IDENTIFIER: US 6567380 B1
TITLE: Technique for selective routing updates

Detailed Description Text (8):
In order to perform routing operations in accordance with the BGP protocol, each interdomain router 300 maintains a routing table 700 that lists all feasible paths to a particular network. The routers further exchange routing information using routing update messages 500 when their routing tables change. The routing update messages are generated by an updating (sender) router to advertise optimal paths to each of its neighboring peer (receiver) routers throughout the computer network. These routing updates allow the BGP routers of the autonomous systems to construct a consistent and up-to-date view of the network topology.

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Search Results - Record(s) 1 through 3 of 3 returned.

☐ 1. Document ID: US 6553423 B1
L17: Entry 1 of 3 File: USPT Apr 22, 2003

US-PAT-NO: 6553423
DOCUMENT-IDENTIFIER: US 6553423 B1
**** See image for Certificate of Correction ****

TITLE: Method and apparatus for dynamic exchange of capabilities between adjacent/neighboring networks nodes

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 2. Document ID: US 6058113 A
L17: Entry 2 of 3 File: USPT May 2, 2000

US-PAT-NO: 6058113
DOCUMENT-IDENTIFIER: US 6058113 A

TITLE: Method for enhancing resource reservation communication

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 5402478 A
L17: Entry 3 of 3 File: USPT Mar 28, 1995

US-PAT-NO: 5402478
DOCUMENT-IDENTIFIER: US 5402478 A

TITLE: System and method for call-by-call source routing with rule-based fallbacks

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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L10: Entry 5 of 43 File: USPT Oct 21, 2003

DOCUMENT-IDENTIFIER: US 6636895 B1
TITLE: System, device, and method for distributing multicast routing information in a protocol independent multicast network

Brief Summary Text (10):
In order to route the multicast packet between PIM domains, border routers in each PIM domain (each referred to hereinafter as a Multicast Border Gateway Protocol or MBGP router) determine interdomain routes (referred to hereinafter as MBGP routes) for the (source, group) pair. The MBGP router is typically a Multicast Source Discovery Protocol (MSDP) router or a PIM Multicast Border Router (PMBR) that functions as a Border Gateway Protocol (BGP) router to receive and install MBGP routes. MSDP, PMBR, and BGP are described in IETF documents and are well-known in the art. The MBGP routes need to be distributed to all PIM routers in the PIM domain so that all PIM routers will have consistent routing information.

CLAIMS:

22. The method of claim 19, wherein collecting the interdomain multicast routing information from the number of border devices by the bootstrap device comprises: opening a Transmission Control Protocol connection to cach border device; and using a BGP mechanism to obtain MBGP routes from each border device over the corresponding Transmission Control Protocol connection.

policy

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L10: Entry 28 of 43 File: USPT Sep 24, 2002

DOCUMENT-IDENTIFIER: US 6456594 B1
TITLE: Multi-protocol communications routing optimization

Other Reference Publication (208):
Using the Border Gateway Protocol for Interdomain Routing,
http://www.cisco.com/univercd/cc/td/doc/cisintwk/ics/icsbgp4.htm, Sep. 10, 1998.

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L12: Entry 5 of 8 File: USPT May 30, 2000

DOCUMENT-IDENTIFIER: US 6069895 A
TITLE: Distributed route server

Detailed Description Text (5):
In accordance with the ISO/IEC 10589 protocol, routing domains are composed of areas within which detailed routing information is maintained within individual network elements that comprise an area. These network elements are referred to as Intermediate Systems (IS). They are capable of dynamic auto-configuration of the area topology as well as the forwarding of protocol data units (PDU) received from adjacent nodes known as neighbours. Each node develops a routing table which allows PDUs to be forwarded based on some optimal policy such as a Shortest Path First (SPF) algorithm. While neighbours use a Hello-protocol to maintain adjacency, a "flooding" scheme is used to exchange authenticated link states throughout an area. In a flooding scheme, when an IS receives a PDU it automatically copies the PDU to all adjacent nodes with which it has a neighbouring relationship and the PDU thereby propagates throughout the network. Link states carry addressing and quality of service (QOS) information. In accordance with ISO 8473 which relates to a protocol for providing the connectionless mode network service, four metrics are carried: default, delay, expense, and error metrics. Protocol is also flexible enough to permit the creation of sub-nets advertised through designated intermediate systems. The forwarding function provides a connectionless network layer capability where a PDU is carried closer to its destination as it traverses the network domain. Routing between areas is accomplished through a second level of hierarchy where each area is represented by level-2 intermediate system. Level-2 intermediate systems use area addresses to route a packet according to some optimal policy such as SPF to the nearest level-2 IS which in turn forwards the packet within the destination routing area.

Detailed Description Text (7):
In the Internet Protocol (IP), networks consist of autonomous systems (AS) each consisting of routing areas. Within an area area sub-nets are formed for the purpose of establishing adjacencies and flooding of link state information. The OSPF link state protocol is capable of dynamic auto-configuration of the AS topology as well as forwarding of packets received from adjacent nodes. Link states are propagated depending on the location and designation of the routers which are responsible for routing table maintenance and forwarding of packets. Four types of routers are defined. They include: internal, border, backbone and boundary routers. A single router may have more than one designation. Complete link state information is advertised within an area by internal routers while summary route information is advertised on the backbone and by the border and boundary routers. This permits an optimal routing policy such as SPF to be used for routing within an autonomous system. Each router node therefore maintains a topology database, a routing table and a forwarding capability. A Type of Service (TOS) field in the IP packets may be used to create routes based on QOS requirements such as delay, throughput and reliability. All OSPF protocol exchanges are authenticated.

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L10: Entry 34 of 43 File: USPT May 21, 2002

DOCUMENT-IDENTIFIER: US 6392997 B1
TITLE: Technique for group-based routing update with limited per neighbor/adjacency customization

Brief Summary Text (5):
Computer networks may be further interconnected by an intermediate node, called a router, to extend the effective "size" of each network. Since management of a large system of interconnected computer networks can prove burdensome, smaller groups of computer networks may be maintained as autonomous systems or routing domains. The networks within a routing domain are typically coupled together by conventional "intradomain" routers. Yet it still may be desirable to increase the number of nodes capable of exchanging data; in this case, "interdomain" routers executing interdomain routing protocols are used to interconnect nodes of the various autonomous systems. An example of an interdomain routing protocol is the Border Gateway Protocol (BGP) which performs routing between autonomous systems by exchanging routing and reachability information among interdomain routers of the systems. The interdomain routers configured to execute the BGP protocol, called BGP routers, maintain routing tables, transmit routing update messages and render routing decisions based on routing metrics.

Detailed Description Text (6):
In particular, the internetwork layer 306 concerns the protocol and algorithms that interdomain routers 200 utilize so that they can cooperate to calculate paths through the computer network 100. An interdomain routing protocol, such as the Border Gateway Protocol (BGP), is used to perform interdomain routing (for the intemetwork layer) through the computer network 100. The interdomain routers 200 (hereinafter "neighboring peer routers") exchange routing and reachability information among the autonomous systems over a reliable transport layer connection, such as TCP. The BGP protocol "runs" on top of the transport layer to ensure reliable communication among the neighboring routers.

Detailed Description Text (7):
In order to perform routing operations in accordance with the BGP protocol, each interdomain router 200 maintains a routing table 206 that lists all feasible paths to a particular network within an autonomous system. The routers further exchange routing information using routing update messages 400 when their routing tables change. The routing update messages are generated by an updating router to advertise optimal paths to each of its neighboring peer routers throughout the computer network. These routing up-dates allows the BGP routers of the autonomous systems to construct a consistent and up-to-date view of the network topology.

Detailed Description Text (13):
FIG. 6 is a functional block diagram illustrating the improved routing update technique performed by the route processor 202 of an interdomain router 200. According to the inventive technique, the interdomain router generates a routing update message comprising a message data portion 600 and further generates a plurality of headers 610a-n, each associated with a neighboring peer router. Each header is a data structure containing a plurality of pointers, one of which contains an address that references the beginning of the message data portion structure 600 stored in a memory, such as memory 204, of the interdomain router; this pointer is called the message pointer 612a-n. An example of the message data portion 600 may include the various fields of the BGP update message 400 (FIG. 4).

CLAIMS:

11. The apparatus of claim 10 wherein routers are interdomain peer routers within autonomous systems of the computer network and wherein the routing update message is a border gateway protocol (BGP) update message.

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L9: Entry 8 of 41 File: USPT May 6, 2003

US-PAT-NO: 6560654
DOCUMENT-IDENTIFIER: US 6560654 B1

TITLE: Apparatus and method of maintaining timely topology data within a link state routing network

DATE-ISSUED: May 6, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fedyk; Donald	Groton	MA		
Ashwood-Smith; Peter	Hull			CA
Miernik; Jerzy	Allen	TX		
Dysart; Keith	Stittsville			CA

US-CL-CURRENT: 709/239; 370/238, 709/235, 709/242

ABSTRACT:

An apparatus and method of forwarding a first message from a source to a destination via a link state routing network utilizes point-to-point feedback messages when the quality of a first path from the source to the destination meets some prescribed condition. To that end, the first path is initialized within the link state routing network. A feedback message having data relating to a quality of the first path then is received as a point-to-point message that is forwarded to the source. In response to receipt of the feedback message, a second path is initialized from the source to the destination. The first message then is forwarded to the destination via the second path.

64 Claims, 4 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

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L9: Entry 18 of 41 File: USPT Jul 9, 2002

US-PAT-NO: 6418476
DOCUMENT-IDENTIFIER: US 6418476 B1

TITLE: Method for synchronizing network address translator (NAT) tables using the open shortest path first opaque link state advertisement option protocol

DATE-ISSUED: July 9, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Luciani; James V.	Groton	MA		

US-CL-CURRENT: 709/238; 370/401

ABSTRACT:

A method for distributing Network Address Translator (NAT) translation table information among border routers associated with a routing domain using the Open Shortest Path First (OSPF) Opaque Link State Advertisement (LSA) option protocol. The NAT translation table information is included in an application specific field following the LSA header. LS type 9 LSA packets are used to limit the flooding scope to the local network segments attached to the border router. Network address information, i.e., local network address and corresponding global network address, are transmitted in the application specific field of the Opaque LSA packet. The Opaque LSA packets are exchanged between a group of interconnected Opaque LSA capable border routers so that the border routers can maintain identical NAT translation tables as necessary to forward data packets according to the NAT forwarding paradigm.

16 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

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L17: Entry 2 of 3 File: USPT May 2, 2000

DOCUMENT-IDENTIFIER: US 6058113 A
TITLE: Method for enhancing resource reservation communication

Detailed Description Text (14):
As also seen in FIG. 2, the receiving communication device 36 has an application entity 60, policy control 62, admission control 54, packet scheduler 56 and classifier 58. The determinations and checks made, as described above with reference to the sender node 32, are also made at the receiving mode 36. The protocol system process 50 of the receiving communication device 36 interacts with its application entity 60, policy control 62, admission control 54, packet scheduler 56, classifier 58 for executing the proper steps for the processing of receiving and transmitting data messages within the network. Likewise, the protocol system process 52 for the switching node 34 communicates with its associated classifier 64, packet scheduler 66, admission control 68 and policy control 70 when processing messages from sender nodes, receiving nodes or other intermediate switching nodes. For further details on the resource reservation protocol and its operation in a multicast network, reference can be made to: R. Braden et al., "Resource ReSerVation Protocol (RSVP)--Version 1 Function Specification" Internet Draft, June 1997, and L. Zhang et al., "RSVP: A New Resource ReSerVation Protocol", IEEE Network Magazine, September 1993, which are incorporated herein by reference.

Detailed Description Text (18):
When a switching node 34 receives a reservation message, it must verify that proper resources through traffic control at the switching node. The protocol system process 50 of the receiver node 36 transmits the reservation message to the corresponding protocol system process 52 of the switching node 34 along the multicast path. The protocol system process 52 of the switching node 34 communicates with the classifier 64, packet scheduler 66, admission control 68 and policy control 70 to reserve resources required of the receiving node 36. Other intermediate switching nodes such as switching nodes 34A-34C for receivers 36C.sub.1 -36C.sub.3 along the multicast path to the sender 32 of FIG. 1 follow the same process of communication. The routing protocol daemon 71, FIG. 2, is the resident system software in the switching nodes 34 to process various routing protocols and maintain the routing table. Examples of routing protocols used in maintaining a routing table include Open Shortest Path First (OSPF) and Routing Information Protocol (RIP), among other routing protocols.

Detailed Description Text (20):
need to send the reservation message from the switching node upstream to the sender node 32. This is performed to reduce the number of messages when further processing in the upstream switching nodes is not required. If it is determined that the reservation is to be sent, then the reservation message is sent from the protocol system process 52, FIG. 2, of the switching node 34 back to the protocol system process 48 of the sender node 32. FIG. 6 illustrates packet structures which are preferably used in the present invention. The format of a path message 310 is shown with information relating to: a common header, integrity, session, RSVP hop, time value, policy data, sender specification and advertisement specification. The reservation message 320 contains information relating to: a common header, integrity, session, RSVP hop, time value, reservation confirmation, scope, policy data, style and flow specification. The resource maintenance message 330 of FIG. 6, contains a common header, integrity, session as well as the maintenance specification. The operation of the resource maintenance message 330 is discussed in further detail with reference to FIG. 5.

L2: Entry 1 of 2 File: USPT Jul 2, 2002

DOCUMENT-IDENTIFIER: US 6415323 B1
TITLE: Proximity-based redirection system for robust and scalable service-node location in an internetwork

Detailed Description Text (20):
FIG. 1 shows an example of typical components and interconnections that comprise a portion of the Internet 100. Internet service providers (ISPs) 101, 102 and 103 provide Internet access. A typical ISP operates an IP-based network across a wide area to connect individual customer networks 104 and/or individual users to the network via access devices 106 (e.g., DSL, telephone modems, cable modems, etc.). The typical ISP also peers with other ISPs via exchange points 108 so that data traffic can flow from a user of one ISP to a user of another ISP. A collection of internal IP routers 110 interconnected with communications links 111 provide connectivity among users within an ISP. Specialized border routers 112 situated at the exchange points forward non-local traffic into and out of the ISP. Often, an individual ISP network, such as ISP 103, is called an autonomous system (AS) because it represents an independent and aggregatable unit in terms of network routing protocols. Within an ISP, intradomain routing protocols run (e.g., RIP or OSPF), and across ISPs, interdomain routing protocols run (e.g., BGP). The term "intradomain protocol" is often used interchangeably with the term interior gateway protocol (IGP).

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L2: Entry 2 of 2 File: USPT Mar 26, 2002

DOCUMENT-IDENTIFIER: US 6363053 B1
TITLE: Method and apparatus for measurement-based conformance testing of service level agreements in networks

Detailed Description Text (7):
To get the packet to the final destination, a router may use a routing table to determine the next network device to send the current packet. The routing table may be periodically updated by adjacent network devices. Such a dynamic routing table may be updated using one of several protocols, such as Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), External Gateway Protocol (EGP), Internal Gateway Protocol (IGP), or Common InterDomain Routing (CIDR), for example. A simplified exemplary routing table is shown below in TABLE 1.

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L4: Entry 8 of 28 File: USPT Aug 5, 2003

US-PAT-NO: 6603756
DOCUMENT-IDENTIFIER: US 6603756 B1

TITLE: Hierarchical label switching across multiple OSPF areas

DATE-ISSUED: August 5, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tappan; Daniel C.	Boxborough	MA		

US-CL-CURRENT: 370/351; 370/399

ABSTRACT:

A router has a first interface to receive a packet from an external autonomous system and a second interface to transmit the packet as an outgoing packet to a border router. A processing engine places a first tag on the outgoing packet in accordance with a standard tag switching protocol. A shared field in the outgoing packet has at least one bit to indicate a use of the shared field, the at least one bit set by the processing engine to indicate the shared field carries a second tag, the second tag indicating a route from the border router to a destination of the packet.

22 Claims, 9 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

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L4: Entry 8 of 28 File: USPT Aug 5, 2003

DOCUMENT-IDENTIFIER: US 6603756 B1
TITLE: Hierarchical label switching across multiple OSPF areas

Detailed Description Text (2):
To understand how the present invention reduces routers' required topological-informational storage, consider the data-packet-forwarding scenario that FIG. 6 illustrates. FIG. 6 depicts transmission of a packet from a source router S to a destination node D. The forwarding path passes through a routing domain 44 to which neither S nor D belongs. That is; routers within routing domain 44 maintain a consistent view of that domain's internal topology by exchanging OSPF messages with each other, but they send no OSPF messages outside the domain. This may be because the domain 44 is the property of, say, an ISP, whereas nodes S and D are owned by that ISP's customers. (As those skilled in the art will recognize, routers within domain 44 will typically use, say, the Border Gateway Protocol ("BGP") to send router S some type of routing information. But the information it thereby receives about the domain's internal topology depends on that domain's policy and is normally extremely limited.)

L10: Entry 12 of 43 File: USPT Jun 24, 2003

DOCUMENT-IDENTIFIER: US 6584093 B1
TITLE: Method and apparatus for automatic inter-domain routing of calls

Detailed Description Text (5):
BGP is an inter-domain routing protocol for backbone IP networks that make up the larger Internet. The following is a list of some of BGP's important features: BGP speakers do not discover each other. The network administrator for each ISP has to manually configure a neighborhood relationship between two routers before they can exchange BGP updates. If two BGP neighbors belong to two different ASes, such as different ISPs, then the protocol running between them is Exterior BGP or EBGP. EBGP is a full-fledged routing protocol. EBGP neighbors must be adjacent to each other, otherwise a tunnel has to be configured between the two neighbors. If two BGP neighbors are in the same AS, then the protocol running between them is Interior BGP or IBGP. IBGP is not a complete routing protocol, it is there only to tunnel BGP information from one border router, across the AS, to a border router on the other side of the AS. For IBGP to work as a full-fledged interior routing protocol, a full mesh neighborhood relationship has to be configured between all BGP speakers inside the autonomous system. For BGP, the path from one AS to another AS represents a single hop. So the hop count along a path is the number of ASes traversed along that path. The BGP next hop is in the next AS towards the destination and not necessarily physically connected to the current router. BGP promotes hierarchical address assignment. This simplifies route aggregation and hence results in significant reduction in the size of routing tables. BGP uses multiple metrics to decide which routes to use and to propagate. The number of ASes traversed to reach the destination network is an important metric in that decision. BGP provides mechanisms to guarantee loop-free advertisement of routes Multiprotocol extension attributes are optional and nontransitive. This means that a BGP speaker who doesn't support the multiprotocol extensions will simply drop these attributes.

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L10: Entry 16 of 43 File: USPT Apr 22, 2003

US-PAT-NO: 6553423
DOCUMENT-IDENTIFIER: US 6553423 B1
**** See image for Certificate of Correction ****

TITLE: Method and apparatus for dynamic exchange of capabilities between adjacent/neighboring networks nodes

DATE-ISSUED: April 22, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chen; Enke	San Jose	CA		

US-CL-CURRENT: 709/230; 370/401, 709/238

ABSTRACT:

A technique to dynamically exchange or update routing capabilities between neighboring peer routers in a computer network without disruption to the operation of the routers. A dynamic capability parameter in an Open message of a Border Gateway Protocol (BGP) enables a router to announce a new capability, or revise or remove a previously announced capability, to a neighboring router when a peer connection is established between the routers. Once announced, the dynamic capability allows the router to exchange a capability message containing updates of capabilities without the need for resetting the existing peer connection. As a result, the technique allows non-disruptive configuration and enabling of capabilities in a manner that improves network stability, while reducing interruption of network services.

26 Claims, 8 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

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L12: Entry 7 of 8 File: USPT May 21, 1996

DOCUMENT-IDENTIFIER: US 5519704 A
**** See image for Certificate of Correction ****
TITLE: Reliable transport protocol for internetwork routing

Abstract Text (1):
A reliable transport protocol, suitable for routing protocols, that works with unicast transmission and multicast transmission, and an improved routing protocol based thereon. Multicast transmissions can be interspersed with unicast transmissions in situations where some of the receivers have received all of the packets sent to them and others have not. A mechanism to deliver multicast packets quickly to some receivers, even when there are unacknowledged packets pending for other receivers. When a packet is multicast from a sender node to all of its neighbors, the sender puts the packet on a queue for each neighbor and retransmits the packet if an acknowledgement has not been received within a predetermined period of time. If the packet is retransmitted, it is transmitted as a unicast. The invention takes advantage of the fact that the sender already has to maintain state information to determine who has not received its packets. A technique for distributing routing information gathered by a router outside an autonomous system of routers using the same routing protocol. A metric calculated by an identical routing protocol or a different routing protocol may be distributed and used by routers in a different autonomous system. Packets may be labeled with authentication information or with an administrative tag that specifies a method of routing in response to policy considerations.

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L11: Entry 23 of 63 File: USPT Jan 22, 2002

US-PAT-NO: 6341127
DOCUMENT-IDENTIFIER: US 6341127 B1

TITLE: Node device and method for controlling label switching path set up in inter-connected networks

DATE-ISSUED: January 22, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Katsube; Yasuhiro	Kanagawa			JP
Saito; Takeshi	Tokyo-to			JP
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US-CL-CURRENT: 370/352; 370/230, 370/360, 370/395.2, 370/401, 370/468

ABSTRACT:

A router device for controlling label switching path set up is disclosed. In the router device, a,policy information indicating a permitted starting point of a label switching path is stored, and a request message that contains a starting point information indicating a starting point node/network of the requested label switching path and a stream information indicating a desired packet stream to be transferred through the requested label switching path is received. Then, whether or not to permit the set up of the requested label switching path is judged by comparing the starting point information contained in the request message with the stored policy information, and the requested label switching path through the router device for the desired packet stream indicated by the stream information contained in the request message is set up when the set up of the requested label switching path is judged as permitted. Instead of the starting point information, a neighbor information, a stream information, or an ending point information may be used.

31 Claims, 19 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 17